

INTERSTATE COMMERCE COMMISSION
WASHINGTON

REPORT NO. 3514
CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC
RAILROAD COMPANY
IN RE ACCIDENT
NEAR LEWIS, IND. , ON
MARCH 28, 1953

SUMMARY

Date: March 28, 1953

Railroad: Chicago, Milwaukee, St. Paul
and Pacific

Location: Lewis, Ind.

Kind of accident: Derailment

Train involved: Freight

Train number: Extra 117C South

Engine number: Diesel-electric units 117C, 117B
and 117A

Consist: 107 cars, caboose

Speed: 38 m. p. h.

Operation: Timetable and train orders

Track: Single; tangent; 0.67 percent
descending grade southward

Weather: Clear

Time: 7:45 p. m.

Casualties: 28 injured

Cause: Broken rail

INTERSTATE COMMERCE COMMISSION

REPORT NO. 3514

IN THE MATTER OF MAKING ACCIDENT INVESTIGATION REPORTS
UNDER THE ACCIDENT REPORTS ACT OF MAY 6, 1910.

CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC RAILROAD COMPANY

May 29, 1953

Accident near Lewis, Ind., on March 28, 1953, caused by
a broken rail.

REPORT OF THE COMMISSION¹

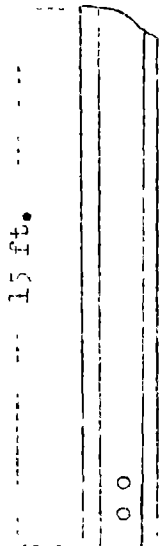
PATTERSON, Commissioner:

On March 28, 1953, there was a derailment of a freight train on the Chicago, Milwaukee, St. Paul and Pacific Railroad near Lewis, Ind., and a subsequent explosion, which resulted in the injury of 4 train-service employees and 24 other persons. This accident was investigated in conjunction with a representative of the Indiana Public Service Commission.

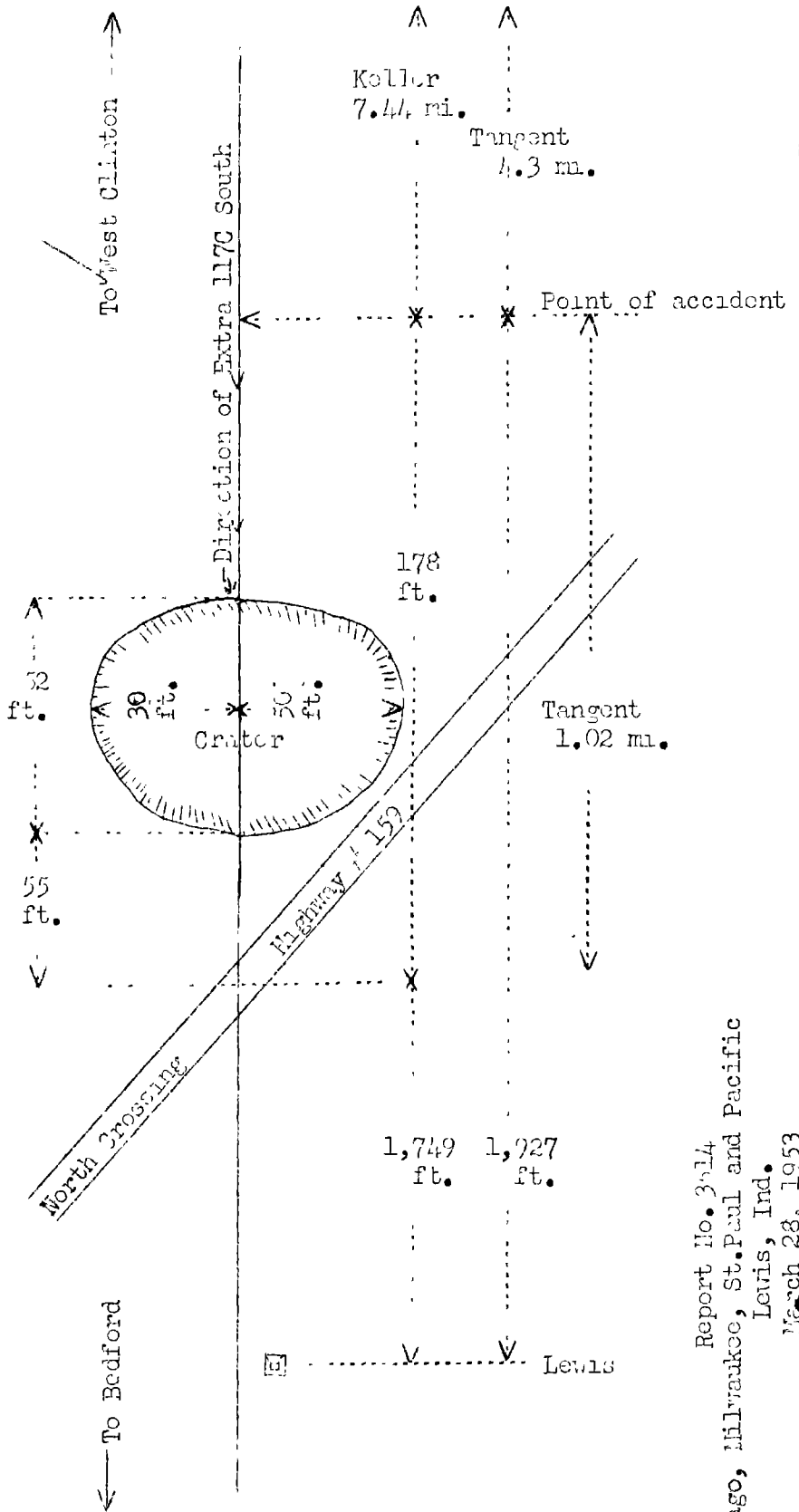
¹ Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.

- West Clinton, Ind. 17.7 mi.
- Preston 6.8 mi
- Belt Junction 1.1 mi.
- Spring Hill 4.9 mi.
- Keller 7.44 mi.
- Point of accident 0.36 mi.
- Lewis 4.9 mi.
- Col. Brent 3.8 mi.
- Latta 58.3 mi.
- Bedford, Ind.

Remainder of rail not definitely identified



Leaving end Sketch showing broken rail



Report No. 3014
 Chicago, Milwaukee, St. Paul and Pacific
 Lewis, Ind.
 March 28, 1953

Location of Accident and Method of Operation

This accident occurred on that part of the Terre Haute Division extending between West Clinton and Bedford, Ind., 105.3 miles. In the vicinity of the point of accident this is a single-track line, over which trains are operated by timetable and train orders. The accident occurred on the main track at a point 37.9 miles south of West Clinton and 1,927 feet north of the station at Lewis. From the north the track is tangent throughout a distance of 4.3 miles to the point of accident and 1.02 miles southward. The grade for south-bound trains is 0.87 percent descending at the point of accident.

In the vicinity of the point of accident the track is laid on a low fill. The track structure consists of 100-pound rail, 23 feet in length, cropped and relaid in its present location in 1942, on an average of 17 treated hardwood ties to the rail length. It is fully tieplated with intermediate single-shoulder tieplates, single-spiked, and is provided with 4-hole 24-inch joint bars and an average of 6 or 7 rail anchors per rail. It is ballasted with gravel to a depth of 10 inches below the bottoms of the ties over a sub-base of crushed stone varying in depth from 6 inches to 1 foot.

State Highway No. 159 twice crosses the railroad at grade in the vicinity of the point of accident. These crossings are designated as the north crossing and the south crossing. They are located, respectively, 1,749 feet north and 976 feet south of the station at Lewis. At the north crossing the highway crosses the railroad at an angle of about 45 degrees. This crossing is 44 feet wide and is provided with 10-inch by 1-inch planking on each side of the rails and diagonal timber headers of the same dimensions in the space between the rails at each end of the crossing. The remaining area of the crossing is surfaced with bituminous material. Flange ways 2 inches wide are provided.

This Commission's regulations for the shipment of explosives by railroad read in part as follows:

Notice to crews of cars containing explosives in freight trains * * *

(f) Notice to crews of cars containing explosives in freight * * * trains. At all terminals or other places where trains are made up by crews other than road crew accompanying the outbound movement of cars, the railroad shall execute a consecutively numbered notice showing the location in the freight train * * * of every car placarded "Explosives." A copy of such notice shall be delivered to the train and engine crew and a copy thereof showing delivery to the train and engine crew shall be kept on file by the railroad at each point where such notice is given. At points other than terminals where train or engine crews are changed, the notice shall be transferred from crew to crew.

Section reference 71.589.

Position in freight train * * * of cars containing explosives.

(g) Position in freight train * * * of cars containing explosives. In a freight train * * * either standing or during transportation thereof, a car placarded "Explosives" shall, when length of train permits, be placed not nearer than the sixteenth car from both the engine or occupied caboose, except: * * *

(3) When transported in a freight train * * * performing pickup and/or setoff service, it shall be placed not nearer than the second car from both the engine or occupied caboose * * *

* * *

The maximum authorized speed for the train in this accident was 40 miles per hour.

Description of Accident

Extra 117C South, a south-bound freight train, consisted of Diesel-electric units 117C, 117B and 117A, coupled in multiple-unit control, 107 cars and a caboose. The eighth car and the forty-eighth to the fiftieth cars, inclusive, were loaded with explosives. This train passed Spring Hill, 12.8 miles north of the point of accident and the last open office, at 7:20 p. m. While it was moving at a speed of 33 miles per hour the forty-first to the sixty-third cars, inclusive, and the front truck of the sixty-fourth car were derailed. The initial point of derailment was 1,927 feet north of the station at Lewis.

A separation occurred between the fortieth and the forty-first cars. The locomotive and the first 40 cars were not derailed and stopped with the front end 3,558 feet south of the point of derailment and the rear end of the fortieth car about 1,168 feet south of the first derailed car. The forty-first car stopped on the west side of the track with the front end 295 feet south of the point of derailment and the rear end at an angle of about 30 degrees to the track. The front truck of the sixty-fourth car stopped in line with the track and the other derailed cars stopped at various angles to and across the track location. Inflammable material from derailed cars became ignited and some of the explosives in the derailed cars were detonated by the fire. The resultant explosions blasted a crater about 20 feet deep and 50 feet in diameter, with the center about 100 feet south of the point of derailment. The track structure in the immediate vicinity of the crater was destroyed. The force of the explosions shifted the positions of some of the derailed equipment, and after the accident the derailed cars extended along the track throughout a distance of about 535 feet and to points 78 feet west and 42 feet east of the center-line of the track. The explosions scattered fragments of the wreckage over a wide area and unexploded projectiles were intermingled with the wreckage. The sixty-fourth car was somewhat damaged and the other derailed cars were destroyed.

The fireman, the conductor, the front brakeman and the flagman were injured.

The weather was clear and it was dark at the time of the accident, which occurred about 7:45 p. m.

Discussion

Extra 1170 South was moving on tangent track at a speed of 5 miles per hour, as indicated by the tape of the speed-recording device, in territory where the maximum authorized speed was 40 miles per hour, when the derailment occurred. A terminal test of the brakes of this train was not made at Falthorn, 161.3 miles north of the point of accident, the initial terminal, and a road test of the brakes on the cars added at Belt Junction was not made as required by the carrier's rules. However, the brakes functioned properly when used on route. The headlight was lighted brightly. The engineer, the fireman and the front brakeman were maintaining a lookout ahead from the control compartment at the front of the locomotive. The conductor, the flagman and the swing

brakeman were in the caboose. When approaching Lewis the engineer felt a surge in the movement of the train immediately before the brakes became applied in emergency. The locomotive was closely approaching the south crossing of highway No. 159 when brake-pipe pressure became depleted, and it stopped with the front end about 650 feet south of the crossing.

Immediately after the train stopped, the front brakeman alighted from the locomotive on the south side of the track and proceeded northward to open the crossing for traffic on the highway. The locomotive and the first eight cars were detached from the other cars and moved southward to clear the crossing. As he inspected the forward portion of the train to ascertain the cause of the emergency application of the brakes, he observed a small fire some distance back in the train and as he proceeded northward he met a car department employee, who informed him that cars were derailed and that the wreckage was afire. The fire was rapidly increasing in size, and he communicated by telephone with the train dispatcher and informed him that a derailment had occurred and the wreckage was afire. Several explosions occurred and the fire continued to increase in intensity. He then left the telephone and returned with the fireman to the locomotive. The engineer said that he had observed the fire from the windows on both sides of the control compartment and that the fireman had alighted from the locomotive and proceeded toward the rear of the train to assist the front brakeman. After several explosions had occurred the front brakeman and the fireman returned and informed the engineer that it was unsafe to remain in the vicinity. The locomotive and the first eight cars were then moved to Coalmont, 4.9 miles south of Lewis.

The members of the crew at the rear of the train alighted from the caboose immediately after the train stopped. They observed that a small fire had started and several minutes later explosions occurred in the wreckage.

Witnesses who were in an automobile waiting to cross the track at the north crossing of highway No. 159 at Lewis observed sparks flying in the vicinity of the wheels or from the rails under an approaching car as the train was moving over the crossing but they observed no fire until after the derailment had occurred. A locomotive fireman residing in the vicinity of the crossing arrived at the point of accident several minutes after the derailment had occurred. He said that at that time there was a small fire in the wreckage on the west side of the track. When he observed

that one of the derailed cars bore an "Explosives" placard he immediately warned the drivers of automobiles waiting to cross the track at the crossing and other residents in the vicinity. A car department employee was in an automobile approaching the north crossing and observed sparks flying from the brake shoes of cars as the train was moving over the crossing. After the derailment occurred he observed that a small fire had started at ground level near the center of the wreckage, and, because he had observed an "Explosives" placard on a derailed car, he immediately proceeded toward the locomotive to warn the members of the crew.

After the accident examination of the equipment which was not destroyed disclosed no condition that would have caused or contributed to the cause of the derailment. Journal boxes were examined and no indication of an overheated journal was found. There was no indication of dragging equipment nor of an obstruction having been on the track. A broken rail was found on the west side of the track. This rail was manufactured in November, 1906. It was broken at a point 15 feet from the receiving end. A progressive fracture extended through about 45 percent of the head. This fracture was 1-3/4 inches long at the top surface of the head of the rail and it extended downward to a depth of 1 inch. The fracture was discolored and evidently had existed for some time. The remainder of the break was new. There were three driving-wheel burns on the rail near the break. Two sections of rail, 17 1/2 inches and 7 feet in length, each of which bore batter marks, were found in the wreckage. The west and the east rails were missing throughout distances of 103 feet and 113 feet, respectively, immediately south of the point of accident. Because of the explosions which occurred in the wreckage, many portions of the rails were scattered over a wide area. All except about 85 lineal feet of the missing rail was found. Most pieces were found within a radius of 800 feet of the point of accident but one piece of rail was found at a distance of 2,000 feet from the center of the wreckage. However, because of the damage it was impossible to identify separated fragments of the rails or their previous positions in the track structure.

Apparently a piece of the failed rail was dislodged by the wheels of the fortieth car. The tread of the front wheel on the west side of the rear truck of the forty-first car was marked. Cuts 3/16 inch and 1/8 inch deep extended inward from the rim of the wheel. The marks were 15 inches

apart and other abrasions were found on the rim of the wheel. These marks apparently resulted from striking a broken rail. Scraping marks were found on the inner side of the flange of the companion wheel and on the bottoms of the drop-doors. The rear truck of this car was first derailed to the west. A separation occurred between this car and the forty-second car. The first clear marks of the derailment were found near the center of the north crossing of highway No. 159. At this point all wheels of the rear truck were outside the west rail. The point at which the wheels had crossed the west rail could not be determined. The marks on the west side of the track indicate that the truck continued parallel to the west rail south of the crossing and that the resultant fulcrum action on the front truck had caused it to become derailed to the east immediately south of the crossing. The car then overturned and stopped at a point about 110 feet south of the crossing. The knuckle at the front end of the car was broken. The forward portion of the train stopped 1,168 feet southward. The other derailed equipment stopped between the initial point of derailment and the crossing and the wreckage was shifted by the explosions which followed.

The train was assembled at Faithorn, and departed therefrom at 1:35 p. m. Service was performed en route and when it departed from West Clinton it consisted of a 3-unit Diesel-electric locomotive, 73 cars and a caboosc. At Belt Junction the locomotive and the first 35 cars were detached and 34 cars which had been assembled and moved from Hulman yard in Terre Haute, Ind., were picked up and placed between the separated portions of the train. When the train departed from Belt Junction about 7:15 p. m., the forty-eighth, forty-ninth and fiftieth cars were, respectively, Chicago & Eastern Illinois 64263, Chicago & Eastern Illinois 65062 and Illinois Central 29114. These were 100,000-pound capacity box cars of all-steel construction with corrugated ends and wood floors. The Chicago & Eastern Illinois cars were equipped with corrugated steel doors and the Illinois Central car was equipped with 3-panel plate steel doors. The former were loaded with 64,220.6 pounds and 60,700 pounds of high explosives, respectively. This material was in powder form and was packed in boxes. The Illinois Central car was loaded with artillery ammunition having a net weight of 116,640 pounds. The ammunition was packed in boxes, each of which contained two pounds. The car contained 972 boxes.

After the accident occurred fused projectiles and shell casings which had been loaded in the Illinois Central car were scattered throughout the area covered by the wreckage. A witness who observed the train when the derailment occurred said that a small fire started in the wreckage immediately afterward. Other witnesses observed the fire a few minutes after the accident occurred, and said that it increased rapidly, and burned with great intensity. The explosions which afterward occurred began several minutes after the fire was first observed and increased in frequency and violence as the fire increased in size and intensity.

The Chicago & Eastern Illinois cars were loaded at a powder magazine on March 26, 1953. They were inspected before and after loading and no defective condition was found. Both cars were received in interchange in a cut of 28 cars delivered by the Chicago & Eastern Illinois to the Chicago, Milwaukee, St. Paul & Pacific at Hulman yard, Terre Haute, Ind., about 2:00 p. m., March 28, 1953. The Illinois Central car was loaded at an ordnance plant on March 23, 1953. It was received in interchange in a cut of 30 cars delivered by the Pennsylvania Railroad to the Chicago, Milwaukee, St. Paul & Pacific at Van yard, near Terre Haute, about 8:15 p. m., March 27, 1953. It was moved the same day to Hulman yard, 7.2 miles, arriving at 11:15 p. m. The car was inspected by members of the mechanical force of the carrier at Van yard and at Hulman yard. In each instance no defective condition was found. Each of these three cars bore "Explosives" placards. At Hulman yard they were assembled as the thirteenth, fourteenth and fifteenth cars of a cut of 34 cars destined to Belt Junction, 1.9 miles. This cut of cars was inspected by members of the mechanical force and no defective condition was found before it departed in a transfer movement which arrived at Belt Junction about 5:00 p. m., March 28, 1953.

This Commission's regulations for the movement of cars containing explosives in freight trains provide that, at terminals or other places where trains are made up by crews other than the road crew accompanying the outbound movement, a copy of the notice showing the location in the train of every car placarded "Explosives" shall be delivered to the train and engine crew; at points other than terminals where crews are changed this notice shall be transferred from crew to crew; and that cars placarded "Explosives" when transported in a freight train performing pickup and/or setoff service shall be placed not nearer than the second car from both the engine or occupied caboose.

In the instant case notice of a car placarded "Explosives" was not issued to the members of the crew of Extra 1170 South before the train departed from Faithorn with one car so placarded. At Belt Junction where three cars of explosives were in a cut of 34 cars added to the train, the swing brakeman boarded the caboose with the waybills when the train departed. Notice of explosives for the placarded cars which had accompanied the transfer movement from Hulman yard were in an unmarked envelope with the waybills. As a result members of the crew were not aware that the three cars placarded "Explosives" were included in the consist until they recorded them on the movement report. A copy of the notice was not delivered to the engine crew. Chesapeake and Ohio 16293, loaded with ammunition and placarded "Explosives" moved as the eighth car in this train from Faithorn to Latta, Ind.

After the train departed from Belt Junction, members of the crew made frequent observations of the equipment and observed no defective condition. The operator at Spring Hill, Ind., 12.3 miles north of the point of accident, inspected the train from the ground on the west side of the track as it passed his office and observed no defective condition. He gave proceed signals with a white light when the rear of the train passed. Members of the crew of a work extra assigned to mine-run service inspected the east side of the train when it passed their train at an auxiliary track near Keller, Ind., 7.4 miles north of the point of accident, about 7:35 p. m. They observed no defective condition, and proceed signals were given when the rear of the train passed the switch of the auxiliary track.

The track in the vicinity of the point of accident was last inspected by the section foreman about 5:15 p. m. the day before the accident occurred, at which time no defective condition was observed. A rail-defect detector car was last operated over this territory on December 8, 1952. Examination of the tape of the recording device disclosed numerous indications of driving-wheel burns on rails in the vicinity of the point of accident and several on the failed rail but none of these indications was interpreted by the railroad as having been caused by a fracture. In a five-year period preceding the day of the accident six defective rails have been removed from the track in the two-mile section of track immediately adjacent to the point of accident.

Cause

It is found that this accident was caused by a broken rail.

Dated at Washington, D. C., this twenty-ninth day of May, 1953.

By the Commission, Commissioner Patterson.

(SEAL)

GEORGE W. LAIRD,
Acting Secretary.